CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

# PRELIMINARY MAP 47-17

# MIRA-FRAMBOISE

## RICHMOND AND CAPE BRETON COUNTIES

## NOVA SCOTIA

Scale- 1 inch to 1 mile

1 0 1 2 3

## DESCRIPTIVE NOTES

*The bedrock surface of the area is a gently tilted peneplain, reaching a height of more than 600 feet in the northwest and dipping below the sea to the southeast. Infolded and infaulted beds of softer Carboniferous rocks form broad, and usually parallel, valleys below the level of the tilted peneplain, such as East Bay, Braes Brook Valley, and Salmon River Valley. There is some evidence that the other pronounced valley, that of Mira River, follows a fault. Large parts of the area are covered with glacial drift, and with few exceptions all interstream hills may be assumed to be composed of drift about equal in thickness to their height above the nearby general level. Other areas, usually relatively small but fairly numerous, have almost no overburden, but in many instances are occupied by bogs through which bedrock rises in knolls.*

*As field work is to be continued in this area, it was thought advisable in compiling the accompanying map to reserve judgment of geological conditions beneath most of the drift-covered areas until all pertinent outcrop information had been obtained. For the same reason, certain sedimentary strata about whose age and relations some doubt now exists are unclassified, and their alternative possible groupings are indicated by sub-letters (a, b, c, etc.).*

*What are probably the oldest formations comprise a group (1) of volcanic and sedimentary rocks underlying the southeast part of the map-area. They are predominantly pyroclastic in origin, and range from coarse volcanic breccia to fine, and commonly water-lain, tuff. Associated with these rocks are beds of shale and sandstone. No lavas were recognized as such, but the pyroclastic material is in many places cut by narrow dykes and bodies of diorite porphyry, and these, if observed in isolated exposures, could not be differentiated from lavas, and it is quite possible, therefore, that such extrusive types are represented. These rocks are older than the Morrison formation (2), and because of the persistence of a recognizable red breccia directly underneath that formation are probably conformable with it.*

*To the north, east, and south of Stirling are areas underlain by volcanic rocks (1a) that in general are very similar to those described (1), but in which greywacke and water-lain tuff seem to be more common. In addition, certain recognizable pyroclastic rocks were encountered to the west of Giant Lake that were not seen to the southeast. Although it is probable that a large part, if not all, of this volcanic and sedimentary assemblage (1a) is equivalent in age to the rocks of group 1, it may be younger.*

*? The Morrison formation (2) is the horizon marker relative to which most of the pre-Carboniferous rocks are referred. The unit, as mapped, has a thickness of 300 to 500 feet or more, the lower four-fifths consisting of a generally recognizable, bright red, micaceous sandstone with some conglomerate. Above the sandstone, and usually not exposed, are from 20 to 40 feet of grey shale, followed by a distinctive white quartzite, which is commonly interlaced with fine quartz veins. The formation has been traced, though not continuously, from the northeast corner of the map-area to near Framboise, where it is lost in drift-covered terrain. West of the map-area, it is again found at St. Esprit and near Grand River. Erratics suggest that the formation is cut off by the granite near the outlet of Upper Marie Joseph Lake.*

*The Morrison formation is succeeded by a group of grey shales and sandy shales, with some red beds (3). These everywhere directly overlie the Morrison, and appear to be conformable with it. The upper parts of the group have yielded Cambrian fossils, and no evidence of a break has been found between the Cambrian beds and the unfossiliferous beds directly overlying the Morrison.*

*A thick formation (4) of pink to grey quartzite, quartzitic conglomerate, sandstone, and conglomerate has been traced from Framboise Intervale, with some gaps, to west of Victoria Bridge. In this distance the character of the rocks changes considerably, particularly in degree of silicification, and some doubt might arise as to whether the mapped areas represent rocks entirely of the same age. Such differences are, however, believed to be due to the relative proximity of intrusive bodies. Conglomerate pebbles in this formation are largely of vein quartz, with minor amounts of a pink quartzite, and in no instance were pebbles derived from the volcanic group (1) observed. Incomplete field evidence suggests that this formation is younger than the Cambrian shale group, and is separated from it by an unconformity. It is possible, too, that some of the volcanic rocks (1a and ? 1) are younger than the quartzites and sandstones (4), but until more information is obtained regarding the nature of the contact between these two formations, the point must be regarded as unsettled.*

*On Kelvin Brook, west of Mira River, a very excellent section is exposed of a thick group of shales and conglomerate (5). The lower member is coarse conglomerate (5a) containing pebbles and small boulders of earlier rocks, including material derived from the volcanic and sedimentary group (1). The conglomerate is succeeded, apparently conformably, by a thick formation of soft, grey and red, mealy shales (5b). The whole assemblage dips toward Mira Valley at angles between 35 and 65 degrees. The age of this group is not known. The strata are younger than the Cambrian shales; younger than, or equivalent to, the quartzite and sandstone (4); and older than the Windsor rocks (8). No fossils have yet been found in them. It is possible that they are the equivalent to the MacAdam Lake formation of Devonian age, but the latter contains pebbles of granite and diorite, neither of which have been found in these conglomerates.*

*Four, large and small bodies of granite, granodiorite, and syenite (6) have known intrusive relations towards rocks as young as the grey shales (3), are believed to cut the quartzite (4), and may quite possibly be younger than the conglomerate and shale (5). Underlying the Windsor rocks, south of Salmon River Valley, are large areas underlain by pink aplite, granite porphyry, and rhyolite, whose relations to the main granite masses are unknown, but which are definitely younger than the conglomerate and shale (5). Diorite and quartz diorite (7) are exposed in large, lenticular bodies about a mile wide, and in numerous smaller dykes, sills, and masses, cutting rocks as young as the quartzite (4), and possibly the conglomerate and shale (5). Because narrow diorite dykes cut the granite (6), the larger diorite bodies are tentatively considered to be younger than these granitic rocks.*

*Carboniferous rocks underlie the valleys of Salmon and Gaspereaux Rivers in a faulted syncline, overlapping older rocks to the south, and down-faulted against granite and volcanic rocks on the north. Windsor rocks (8), which overlap aplite, rhyolite, and shale, consist mainly of coarse red conglomerate together with lenses of red and grey limestone and soft shale. In the Gabarus district are three small outliers of Windsor conglomerate and limestone resting on volcanic rocks. Pennsylvanian rocks (9) overlie the Windsor in the Salmon-Gaspereaux Rivers syncline, and consist of fine grey grit, grey conglomerate, and red-brown conglomerate. This latter type cannot be differentiated from the Windsor conglomerate, and, indeed, all or part of it may consist of Windsor rocks that have been faulted or folded to the surface from beneath the Pennsylvanian.*

*Lead and zinc ore occurs as a replacement of volcanic rocks at Stirling, and was mined for several years in the 'thirties, operations being discontinued in 1938. Molybdenite occurs in narrow veinlets cutting a small granite body at Deep Cove. Magnetite and hematite have been prospected at Grand Mira South, where they occur as veins in, or replacements of, grey shales adjacent to the small granite boss forming Gillis Mountain. Copper was discovered many years ago about a mile north of French Road, and on the east side of Eagle Head. A saline spring is located on Mineral Spring Brook, a tributary of Gaspereaux River. Coal occurs just west of the map-area in Pennsylvanian beds on Gaspereaux River, and was mined during the period in which the Stirling lead-zinc mine was operating.*

## LEGEND

**CARBONIFEROUS**

PENNSYLVANIAN

9 — *Grey grit, grey and red conglomerate, coal*

MISSISSIPPIAN

8 — *WINDSOR GROUP: coarse red conglomerate, limestone, grey shale*

**PRE-CARBONIFEROUS**

PALAEOZOIC

7 — *Diorite, quartz diorite, diorite porphyry*

6 — *Granite, syenite, granodiorite; includes undifferentiated 6a north of Gaspereaux River; age relations to 5 unknown; 6a, aplite, granite porphyry, rhyolite; younger than 5*

5 — *5a, coarse, red-brown to grey conglomerate; 5b, soft, mealy, red and grey shale*

4 — *Pink to grey, fine to conglomeratic, quartzite and sandstone*

**CAMBRIAN AND (?) EARLIER**

PALAEOZOIC AND (?) EARLIER

3 — *Grey and red shale, sandy shale, argillite*

2 — *MORRISON FORMATION: red micaceous sandstone, red and grey conglomerate, white quartzite, grey shale*

1 — *Acidic and basic pyroclastic rocks, with probably some related intrusions; minor grey shale and other sedimentary types; probably includes some undifferentiated 1a; 1a, similar to 1, but includes larger proportion of sandstone and greywacke, and also pyroclastic rocks not found in 1. May be wholly or in part younger than 4.*

**UNCLASSIFIED SEDIMENTARY ROCKS**

A — *Aa, grey shale; may be 3 or 5; Ab, red conglomerate; may be 2, 4, or 5a; Ac, red conglomerate, shale, and sandstone; may be 2 or 5; Ad, red shale; may be 1a or 3; Ae, grey quartzite, conglomerate; may be 1a or 4; Af, grey shale; may be 1 or 3*

*Bedding (horizontal, inclined, overturned)*

*Bedding, direction of dip known, upper side of bed unknown (inclined, vertical)*

*Lineation (including direction of schistosity and foliation)*

*Fault (assumed)*

*Glacial striae*

*Fossil locality* (F)

*Geology by L. J. Weeks, 1944, 1945, 1946.*

*NOTE 1. Blue Mountain, which rises about 175 feet above the surrounding country, may be partly underlain by granite, as slates and shales occurring on the flanks of the hill have been altered to cherty hornfels. No exposures of granite have yet been located, but because of the possibility of their being found, those areas that could be underlain by granite are left uncoloured.*

*NOTE 2. Conglomerates exposed near here, and possibly elsewhere in this Pennsylvanian basin, are very similar to the Windsor conglomerates, but carry no fossils. It is possible that in places, through faulting or folding or both, underlying Windsor rocks are exposed within this area of 9.*

*NOTE 3 Unpatterned areas in the northwest are unexplored; others are drift covered.*

*Road, well travelled*

*Road, not well travelled*

*Trail*

*Marsh*

*County boundary*

*Surveyed by the Topographical Division. Cartography by the Drafting and Reproducing Division, 1947.*